

WHAT IS CLAIMED IS:

1. (Amended) A method for manufacturing a prescribed semiconductor device by forming a film mainly formed of tungsten and a film of a component different from the film mainly formed of the tungsten on a semiconductor substrate, comprising:

forming a first layer, which is formed of the film of the component different from the film mainly formed of the tungsten, on the semiconductor substrate;

forming a second layer, which is formed of the film mainly formed of the tungsten, on the semiconductor substrate; and

forming an oxide film on an exposed surface of the first layer by plasma processing at a process temperature of 300°C or more using a process gas containing oxygen gas and hydrogen gas at a ~~{process temperature of 300°C or more}~~ flow rate ratio (hydrogen gas flow rate/oxygen gas flow rate) of the hydrogen gas to the oxygen gas of 2 or more and 4 or less.

2. The method for manufacturing a semiconductor device according to claim 1, wherein the semiconductor device is a transistor, and a gate electrode is formed of the first layer and the second layer.

3. The method for manufacturing a semiconductor device according to claim 1 or 2, wherein the second layer is a tungsten layer or a tungsten silicide layer.

4. The method for manufacturing a semiconductor device according to any one of claims 1 through 3, where the first layer is a silicon layer.

5. (canceled)

6. (canceled)

7. (Amended) A method for plasma oxidation of a film of a component different from a film mainly formed of tungsten of a semiconductor substrate on which the film mainly formed of the tungsten and the film of the component different from the film mainly formed of the tungsten are formed, comprising:

forming an oxide film on an exposed surface of the film of the component different from the film mainly formed of the tungsten by plasma processing at a process temperature of 300°C or more using a process gas containing oxygen gas and hydrogen gas at a [~~process temperature of 300°C or more~~] flow rate ratio (hydrogen gas flow rate/oxygen gas flow rate) of the hydrogen gas to the oxygen gas of 2 or more and 4 or less.

8. (Amended) The plasma oxidation method according to claim 7, wherein [~~a flow rate ratio (hydrogen gas flow rate/oxygen gas flow rate) of the hydrogen gas to the oxygen gas of the process gas is 1.5 or more~~] the plasma is excited by a microwave.

9. (canceled)